

What is claimed:

1. A water processing device for removing contaminants from water comprising:
5 a) a boiler having a cavity and an upper surface and a bottom surface of the cavity for receiving and boiling the feed water from the heat exchanger to generate product in the form of steam;

10 b) a heater for boiling said feed water in the boiler;
c) a degasser for removing noncondensable gases from said feed water; and
d) a demister for removing droplets containing contaminants from the product steam,
whereby the product steam exiting from the demister is cooled to liquid form in said heat exchanger and recovered as processed liquid product.

15 2. The water processing device of claim 1, further comprising a heat exchanger for heating incoming feed water and cooling outgoing product.

3. The water processing device of claim 2, wherein said heat exchanger comprises:

15 a) a first plate containing a flow directing channel for flow of hot blowdown and vented gases from the boiler, said blowdown travelling in one portion of the flow directing channel and said vented gases travelling in an adjacent portion of said flow directing channel;

20 b) a second plate containing a flow directing channel for flow of incoming feed water and a flow directing channel for flow of incoming cooling water;

25 c) a third plate inserted between the first plate and the second plate for heat exchange between the blowdown in the flow directing channel in the first plate and the incoming feed water in the flow directing channel in the second plate and between the vented gases in the water flow directing channel in the first plate and the cooling water flowing in the flow directing channel of the second plate, such that said blowdown heats said incoming feed water and said cooling water cools said vented gases;

30 d) a fourth plate containing flow directing channels for the product steam exiting from the demister; and

e) a fifth plate inserted between the second plate and the fourth plate for heat exchange between the product steam and incoming feed water and cooling water, such that said product water in the flow directing channels in the fourth plate is cooled by said cooling water in said flow directing channel in said second plate and said feed water in the flow directing channel in said second plate is heated by said product steam.

5 4. The water processing device of claim 1, further comprising a liquid level control device for regulating the volume of water in the boiler.

10 5. The water processing device of claim 1, further comprising a wiper mechanism for removing buildup from the bottom surface of the boiler.

15 6. The water processing device of claim 5, further comprising a shaft for operating said wiper mechanism, said shaft located in the cavity of said boiler and extending through an aperture in the upper surface of said boiler.

20 7. The water processing device of claim 6, further comprising a water seal comprising a hollow tube surrounding the shaft, the bottom of said hollow tube located beneath the water level in said cavity of the boiler and the top of said hollow tube located above the water level in the hollow tube during use, and the diameter of said hollow tube greater than the diameter of said shaft.

25 8. A method for preventing exit of gas around a shaft in a cavity that extends through an aperture where the bottom of the shaft is under liquid in the cavity, comprising inserting a shaft through a hollow tube of greater diameter than the diameter of said shaft where the bottom of the tube lies beneath the surface of a liquid that is under pressure in the cavity, said liquid entering the hollow tube through the bottom until the pressure outside the tube in the cavity and the weight of the water in the tube are equal.